

**British Columbia Marine Faunistic
Survey Report: Holothurians from
the Northeast Pacific**

Philip Lambert

Department of Fisheries and Oceans
Fisheries Research Branch
Pacific Biological Station
Nanaimo, B. C. V9R 5K6

January 1984

**Canadian Technical Report of
Fisheries and Aquatic Sciences
No. 1234**

Canadian Technical Report of Fisheries and Aquatic Sciences

Technical reports contain scientific and technical information that contributes to existing knowledge but which is not normally appropriate for primary literature. Technical reports are directed primarily toward a worldwide audience and have an international distribution. No restriction is placed on subject matter and the series reflects the broad interests and policies of the Department of Fisheries and Oceans, namely, fisheries and aquatic sciences.

Technical reports may be cited as full publications. The correct citation appears above the abstract of each report. Each report is abstracted in *Aquatic Sciences and Fisheries Abstracts* and indexed in the Department's annual index to scientific and technical publications.

Numbers 1-456 in this series were issued as Technical Reports of the Fisheries Research Board of Canada. Numbers 457-714 were issued as Department of the Environment, Fisheries and Marine Service, Research and Development Directorate Technical Reports. Numbers 715-924 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Technical Reports. The current series name was changed with report number 925.

Technical reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page. Out-of-stock reports will be supplied for a fee by commercial agents.

Rapport technique canadien des sciences halieutiques et aquatiques

Les rapports techniques contiennent des renseignements scientifiques et techniques qui constituent une contribution aux connaissances actuelles, mais qui ne sont pas normalement appropriés pour la publication dans un journal scientifique. Les rapports techniques sont destinés essentiellement à un public international et ils sont distribués à cet échelon. Il n'y a aucune restriction quant au sujet; de fait, la série reflète la vaste gamme des intérêts et des politiques du ministère des Pêches et des Océans, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports techniques peuvent être cités comme des publications complètes. Le titre exact paraît au-dessus du résumé de chaque rapport. Les rapports techniques sont résumés dans la revue *Résumés des sciences aquatiques et halieutiques*, et ils sont classés dans l'index annuel des publications scientifiques et techniques du Ministère.

Les numéros 1 à 456 de cette série ont été publiés à titre de rapports techniques de l'Office des recherches sur les pêcheries du Canada. Les numéros 457 à 714 sont parus à titre de rapports techniques de la Direction générale de la recherche et du développement, Service des pêches et de la mer, ministère de l'Environnement. Les numéros 715 à 924 ont été publiés à titre de rapports techniques du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 925.

Les rapports techniques sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Canadian Technical Report of
Fisheries and Aquatic Sciences No. 1234

January 1984

BRITISH COLUMBIA MARINE FAUNISTIC SURVEY REPORT:
HOLOTHURIANS FROM THE NORTHEAST PACIFIC

by

Philip Lambert¹

Department of Fisheries and Oceans
Fisheries Research Branch
Pacific Biological Station
Nanaimo, B.C. V9R 5K6

¹Associate Curator
Aquatic Zoology Division
British Columbia Provincial Museum
Victoria, B.C. V8V 1X4

(c)Minister of Supply and Services Canada 1984

Cat. No. Fs 97-6/1234

ISSN 0706-6457

ABSTRACT

Lambert, P. 1984. British Columbia marine faunistic survey report:
Holothurians from the northeast Pacific. Can. Tech. Rep. Fish. Aquat.
Sci. No. 1234: iii + 30 p.

Thirty-two species of holothurians belonging to fourteen families from the marine waters of British Columbia are reported here. The specimens were collected by the Pacific Biological Station from the intertidal zones to a depth of 2430 metres between the years 1912 and 1972.

RÉSUMÉ

Lambert, P. 1984. British Columbia marine faunistic survey report:
Holothurians from the northeast Pacific. Can. Tech. Rep. Fish. Aquat.
Sci. No. 1234: iii + 30 p.

On signale la présence, dans les eaux marines de la Colombie-Britannique, de 32 espèces d'Holothurides appartenant à 14 familles. Les spécimens ont été capturés à partir des zones intertidales jusqu'à une profondeur de 2 430 mètres par des employés de la Station de biologie du Pacifique, entre 1912 et 1972.

INTRODUCTION

The holothurians listed in this report are from the collections of the Pacific Biological Station (PBS) at Nanaimo. The PBS material was collected primarily during the Fisheries Research Board of Canada Faunistic Survey from 1960-1972 with additional material from 1912 to 1972.

The majority of the specimens are from the waters off British Columbia but a small number were collected in the Gulf of Alaska near Kodiak Island.

A reference collection is deposited at the Pacific Biological Station. The remainder of the PBS material is divided between the B.C. Provincial Museum and the National Museum of Canada.

All identifications were made by the author. Specimens which, as yet, cannot be identified with certainty are given to genus only. New information that has resulted from the study of these collections and taxonomic problems yet to be solved, will be published later. This report is part of a larger project leading toward publication of an identification handbook for the sea cucumbers of British Columbia.

This report is divided into three parts. Part I is a systematic list of all the species in the collection. Within each Family species are listed alphabetically.

Part II presents locality data for each species. For easy reference, species are listed in alphabetical order. Data is in order of year; oldest collection first. The data include when known, date of collection, station number, locality, latitude and longitude, depth, and substrate. When the original data gave only a place name, I used the latitude and longitude data taken from the B.C. Gazetteer. The coordinates refer to the southeast corner of a rectangle one degree in extent in latitude and longitude. The notation following the coordinates (NW, NE, SW or SE) indicates in which quadrant of the rectangle the locality is situated. A question mark (?) in the data indicates that there was insufficient information to determine the coordinates. A dash (-) indicates lack of data.

Part III is a list of references used in identifying west coast holothurians.

ACKNOWLEDGMENTS

I am indebted to Dr. Frank Bernard of the Pacific Biological Station for making the PBS collection available to me, and to Dr. Dan Quayle for supplying additional station data and clearing up some inconsistencies.

Special thanks to Mary Bergen of the Allan Hancock Foundation and Dr. Bill Austin, Koyatan Marine Laboratory, for assistance with identifications. Thanks also to the USNM, Washington; California Academy of Sciences, San Francisco; and MCZ, Harvard, Mass. for loans of identified specimens.

PART I Species included in the Fisheries Research Board Collection

(Classification after Pawson and Fell (1965),

Pawson (1966) and Hansen (1975).

CLASS HOLOTHUROIDEA de Blainville, 1834.

SUBCLASS DENDROCHIROTACEA Grube, 1840

ORDER DENDROCHIROTIDA Grube, 1840

Family Placothuriidae Pawson and Fell, 1965

Family Paracucumidae Pawson and Fell, 1965

Family Psolidae Perrier, 1902

Psolidium bullatum Ohshima, 1915

Psolus sp.

Psolus chitonoides Clark, 1901

Psolus squamatus (Koren, 1844)

Family Phyllophoridae Ostergren, 1907

Subfamily Phyllophorininae Ostergren, 1907

Subfamily Thyoninae Panning, 1949

Pentamera sp. 1

Pentamera sp. 2

Pentamera lissoplaca (Clark, 1924) Deichmann, 1938

Pentamera populifera (Stimpson, 1864) Deichmann, 1938

Pentamera pseudocalcigera Deichmann, 1938

Pentamera trachyplaca (Clark, 1924) Deichmann, 1938

Thyone benti Deichmann, 1937

Subfamily Semperiellinae Heding and Panning, 1954

Family Sclerodactylidae Panning, 1949

Eupentacta pseudoquinquesemita Deichmann, 1938

Eupentacta quinquesemita (Selenka, 1867) Deichmann, 1938

Family Cucumariidae

Subfamily Cucumariinae Ludwig, 1894

Cucumaria frondosa japonica (Gunnerus, 1767) Mortensen, 1932

Cucumaria lubrica Clark, 1901

Cucumaria miniata (Brandt, 1835) Selenka, 1867

Cucumaria piperata (Stimpson, 1864) Clark, 1924

Cucumaria pseudocurata Deichmann, 1938

Cucumaria vegae Theel, 1886

Subfamily Colochirinae Panning, 1949

Subfamily Thyonidiinae Heding and Panning, 1954

Duasmodyctyla commune (Forbes, 1852) Mortensen, 1977

Thyonidium sp.

Thyonidium pellucidum (Fleming) Heding and Panning, 1954

ORDER DACTYLOCHIROTIDA Pawson and Fell, 1965

Family Ypsilothuriidae Heding, 1942

Ypsilothuria bitentaculata (Ludwig, 1894)

Family Rhopalodinidae Perrier, 1902

Family Vaneyellidae Pawson and Fell, 1965

SUBCLASS ASPIDOCHIROTACEA Grube, 1840

ORDER ASPIDOCHIROTIDA Grube, 1840

Family Holothuriidae Ludwig, 1894

Family Stichopodidae Haeckel, 1896

Parastichopus sp. 1

Parastichopus sp. 2

Parastichopus californicus (Stimpson, 1857) Deichmann, 1937

Family Synallactidae Ludwig, 1894

Capheira mollis Ohshima, 1915

Paelopatides confundens Theel, 1886

Pseudostichopus mollis Theel, 1886

Stichopus challengeri Theel, 1886

Clark (1922) p. 46 considered this to be a synallactine

ORDER ELASIPODIDA Theel, 1882

SUBORDER DEIMATINA Hansen, 1975

Family Deimatidae Ekman, 1926

Family Laetmogonidae Ekman, 1926

Pannychia moseleyi Theel, 1886

SUBORDER PSYCHROPOTINA Hansen, 1975

Family Psychropotidae Theel, 1882

Family Elpidiidae Theel, 1882

Amperima naresi (Theel, 1882) Agatep, 1967

Scotoplanes globosa (Theel, 1879) Theel, 1882

SUBCLASS APODACEA Brandt, 1835

ORDER APODIDA Brandt, 1835

Family Synaptidae Burmeister, 1837

Leptosynapta clarki Heding, 1928

Family Chiridotidae Ostergren, 1898

Chiridota albatrossii Edwards, 1907

Chiridota laevis (Fabricius, 1780) Clark, 1907

Family Myriotrochidae Ostergren, 1898

ORDER MOLPADIDA Haeckel, 1896

Family Molpadiidae Muller, 1850

Molpadia intermedia (Ludwig, 1894) Clark, 1907

Family Caudinidae Heding, 1931

Paracaudina chilensis (Muller, 1850) Heding, 1931

Family Eupyrgidae Semper, 1868

PART II BRITISH COLUMBIA MARINE FAUNISTIC SURVEY

HOLOTHURIAN COLLECTION

(Alphabetical by genus and species)

Date	Station	Location	Depth	Bottom
<u>Amperima naresi</u>				
Sept 11 1964	63-213 trans 6 St. 4	50°54.5'N 130°6.0'W off Triangle I.	2200 m	mud
<u>Capheira mollis</u>				
Sept 8 1964	63-184 St. 4 Line 2	48°38.5'N 126°44'W off Tofino	1353 m	mud
Sept 9 1964	63-200 trans 4 St. 3	49°43.5'N 128°28.5'W off Brooks Peninsula	2200 m	mud
Sept 1964	63-213 trans 6 St. 4	50°54.5'N 130°6.0'W off Triangle I.	2200 m	mud
<u>Chiridota albatrossii</u>				
June 26 1966	66-43 A.P. Knight	52°18.0'N 127°51.0'W Jenny Inlet	91 m	rock and gravel
<u>Chiridota laevis</u>				
Sept 1963	63-99	57°23.0'N 151°15.2'W Gulf of Alaska	91 m	sand shell
<u>Cucumariidae</u>				
Aug 19 1962	Haul 6 & 7	53° 133° NE Frederick Is.	-	-

Cucumaria frondosa japonica

Aug 31 1963	63-69	58°7.0'N 151°37'W Gulf of Alaska	126 m	sand- gravel
Sept 24 1963	DBQ	54° 132° SE Cape Edensaw, near Naden Harbour, Q.C.I.	66 m	-
June 1965	65-27	53°44.0'N 130°30.0'W off Tlell, QCI	66 m	gravel
Nov 23 1965	65-106	57°16.9'N 170°1.9'W Pribiloff Is.	37 m	sand

Cucumaria lubrica

July 14 1946	-	51°5.0'N 127°39.0'W Klucksivi mouth Seymour Inlet	-	-
July 20 1959	-	49° 126° NW Louie Creek, Esperanza Inlet	-	-
Sept 28 1960	322	52°59'N 129°28'W Caamano Sound Hecate Strait	64 m	smooth, small rocks
Sept 29 1960	H 328	52° 128° SE Athlone I. 3 mi. West Seaforth Channel	131 m	-
Apr 9 1961	S-4 H-11	48°58'N 125°21'W Barkley Sound	38.4 m	mud
Apr 29 1961	S-4 H-9.7	54°12.8'N 133°07.4'W off Langara I., Q.C.I.	82 m	sand-rock
Aug 15 1962	62-26	52°8.0'N 131°9.9'W Cape St. James	27 m	boulders
Aug 15 1962	Haul 4 & 5	52°10.0' 131°5.0'W Houston Stewart Channel	-	-
Aug 20 1962	Haul 15	?	-	-

Jan 12 1963	63-1	50°36.4'N 126°50.9'W Malcolm I.	113.4 m	firm
Jan 12 1963	63-2	50° 126° NW Malcolm I., Q.C. Strait	-	-
Feb 11 1966	G.H.15	50° 127° NE Hardy Bay	-	-
Apr 1966	-	50° 127° SW Bunsby Is. Ououkinsh Inlet	-	-
July 13 1966	-	48° 123° SW Church I., Becher Bay	24 m	-
June 4 1969	-	53° 132° NW Port Louis, Q.C.I.	-	-

Cucumaria miniata

May 17 1912	-	49° 123° SW Mudge Is., near Gabriola Island	intertidal	-
July 20 1959		49° 126° NW Louie Creek, Esperanza Inlet	-	-
July 21 1959	-	50° 127° SW Grant Bay, Quatsino Sound	intertidal	-
Sept 1 1960	-	? Bromoly Narrows(?)	4.6-7.6 m	-
June 28 1961	-	49° 126° NW Louie Creek, Esperanza Inlet	-	-
May 8 1961	-	52° 131° SE Burnaby Narrows, Q.C.I.	intertidal	-
Sept 13 1962	Haul 1	49°1.1'N 123°34.7'W Porlier Pass	55 m	-
Sept 13 1962	Haul 3	49° 123° SW Porlier Pass	55 m	rock

Jan 15 1963	63-12	50°44.0'N 127°01.6'W Numos Is., Q.C. Strait	55 m	gravel & rock
July 22 1963	-	48° 125° NE Effingham I., Barkley Sound	-	-
July 24 1963	-	59°10'N 148°41'W Jacques I., Gulf of Alaska	137 m	blue clay
Aug 17 1963	-	52° 132° NE Tasu Sound, Q.C.I.	-	-
Feb 1966	66-2	50°49.5'N 127°25.0'W Q.C. Strait	225 m	-
April 1966	-	50° 127° SW Klaskish Anchorage	-	-
Sept 7 1967	-	52° 128° SE Cockle Bay, Milbanke Sd.	-	-
Oct 17 1967	-	50° 126° NE Echo Bay, Gifford I.	-	oyster raft culture
June 2 1969	-	53° 132° SW Seal Inlet, Rennel Sound, Q.C.I.	-	-
June 4 1969	-	53° 132° NW Port Louis, Q.C.I.	-	-
Aug 23 1969	-	51° 128° NE Spider Anchorage, Q.C. Sound	6 m	-
Feb 19 1970	-	52° 131° NE Ramsay I., Lyell I., Q.C.I.	intertidal	-
June 23 1970	-	50° 126° NW Restless Bay, Stewart Narrows	-	-
June 23 1970	-	50°54'N 126°51.5'W Kinnaird I. (probably Kinnaird I.) Wells Passage	intertidal	-
Apr 25 1971	-	49° 126° NW Port Langford, Nuchatlitz Inlet	-	-

May 17 1972	-	51° 127° SW Treadwell Bay (near Rivers Inlet)	-	-
July 2 1972	-	50° 127° SW Cuttle Is., Ououkinsh Inlet	-	-

Cucumaria piperata

Apr 15 1961	S-4 H-48	50° 29.5'N 127° 51'W Quatsino Sound	51-55 m	rocky
June 22 1961	St. 1	49° 123° SW Porlier Pass	-	-
June 25 1961	13	48° 53.1'N 125° 18'W Effingham I., Barkley Sound	137 m	soft & rock outcrop
Nov 10 1961	Haul 3	49° 124° NW Baynes Sound, south end Denman Island	55 m	-
June 28 1962	-	49° 124° NW Exeter Shoal, Str. Georgia	-	-
Sept 13 1962	Haul 1	49° 1.1'N 123° 34.1'W Porlier Pass	55 m	rocky
Sept 13 1962	Haul 11	48° 57'N 123° 37'W Trincomali Ch.	44 m	soft
Sept 13, 1962	3	49° 123° SW Porlier Pass	55 m	rock
June 1970	70-56	50° 3.0'N 127° 39.0'W off Brooks Peninsula	62 m	sand-mud

Cucumaria pseudocurata

Aug 18 1962	-	53° 132° SW Marble I.	-	-
-------------	---	--------------------------	---	---

Cucumaria vegae

Sept 11 1963	-	57° 152° NE islands near Kodiak	intertidal	-
--------------	---	------------------------------------	------------	---

Nov 17 1965	-	53°54.5'N 166°32'W Amaknak I., South Pt., Unalaska Bay	intertidal	-
Sept 7 1967	-	52° 128° SE Milbanke Sound	intertidal	-
May 29 1970	-	50° 126° NE Echo Bay, Gilford I.	-	-
May 17 1972	-	51° 127° SW Treadwell Bay (near Rivers Inlet)	-	-

Duasmodactyla commune

Jan 12 1963	63-1 DBQ	50°36.4'N 126°50.9'W Malcolm I.	113 m	-
Sept 10 1963	63-119	56°30.0'N 152°35.0'W off Kodiak I.	201 m	-
Sept 15 1963	63-130	56°1.0'N 154°28.0'W S. of Kodiak I.	228 m	-

Eupentacta pseudoquinquesemita

Sept 29 1960	H328	52° 128° SE 3 m west Athlone I. Seaforth Channel	73 m	-
May 12 1961	S-4 H-135	48°48.1'N 123°13'W Georgia Strait	15 m	mud
Sept 13 1962	Haul 9	48°58'N 123°37'W Kuper I.	22 m	soft
Jan 12 1963	63-2	50°36.9'N 126°57.7'W Malcolm I., near Alert Bay	26 m	sand
Jan 12 1963	63-4	50°40.4'N 127°11.0'W Malcolm I.	59 m	mud
April 21 1966	-	50° 126° NW Canoe Passage, Knight Inlet	intertidal	-

May 29 1970	-	50° 126° NE Echo Bay, Gilford I.	-	oyster culture raft
June 23 1970	-	50° 126° NW Restless Bay, Stuart Narrows Wells Passage	intertidal	-

Eupentacta quinquesemita

June 19 1955	-	54° 132° SW Mazarredo Is., Naden Hbr., Q.C.I.	-	-
June 20 1959	#29	48° 125° NE Effingham I.	-	-
July 19 1959	-	50° 127° NW Roller Bay, Bull Hbr., Hope I.	-	-
April 12 1961	-	49° 15'N 125° 55'W Cypress Bay, Clayoquot Sound	37 m	soft
June 26 1961	#26	48° 125° NE Effingham Island	-	-
June 28 1961	-	49° 126° NW Louie Creek, Esperanza Inlet	-	-
Aug 15 1962	Haul 4 & 5	52° 10.0'N 132° 5.0 W Houston Stewart Channel, Q.C.I.	-	-
Sept 13 1962	Haul #3	49° 123° SW Porlier Pass	55 m	rock
July 22 1963	-	48° 125° NE Effingham I.	-	-
July 28 1964	-	48° 123° NW Gov't wharf, Crofton	-	-
Aug 18 1964	-	49° 123° SW Brandon I., Departure Bay	-	-
Sept 15 1968	-	50° 127° NW Bull Harbour	intertidal	-

June 2 1969	-	53° 132° SW Seal Inlet, Q.C.I.	-	-
June 4 1969	-	53° 132° NW Port Louis, Q.C.I.	intertidal	-
Aug 23 1969	-	51° 128° NE Spider Anch. (near Calvert I., Q.C. Sound)	6 m	-
Apr 25 1971	-	49° 126° NW Port Langford, Nuchatlitz Inlet	-	-
Apr 19 1972	-	48° 125° NE Bauke I., Barkley Sound	intertidal rocky	-

Leptosynapta clarki

June 26 1962	Drag 4	50° 124° SW Pendrell Sound	73 m	mud
May 17 1972	-	51° 127° SW Treadwell Bay, near Rivers Inlet	-	-

Molpadia intermedia

Aug 9 1950	-	? 2 mi. east Native Pass	236 m	-
July 5 1951	VR 2	? Verney Channel	-	-
June 16 1954	-	49° 125° SW Bedwell Sound, Clayoquot Sd.	-	-
July 26 1960	-	48° 123° NE Plumper Sound, Saturna I.	-	-
Apr 12 1962	Ser. #1 St. K6	53° 128° NW Kitimat (label on outside of jar)	205 m	-
Sept 5 1963	63-85	57°36.8'N 151°48.0'W Kodiak I.	128 m	-

Sept 6 1963	63-99	57°23.0'N 151°15.2'W near Kodiak I.	91 m	clay- sand
Sept 10 1963	63-118	56°31.0'N 152°17.0'W off Kodiak I.	256 m	-
Apr 16 1964	63-147	53°42.0'N 132°20.5'W Masset Inlet, Q.C.I.	91 m	mud
Sept 8 1964	63-191 trans. 3 St. 1	49°32.0'N 127°3.0'W off Nootka Sound	115 m	mud- sand
Sept 12 1964	63-218	50°42.2'N 127°8.4'W Queen Charlotte Strait	137 m	mud

Paelopatides confundens

Sept 7 1964	63-179 line 2 St. 5	48°29.5'N 126°52.0'W off Tofino	2200 m	mud
Sept 9 1964	63-200 trans. 4 St. 3	49°43.5'N 128°28.5'W off Brooks Peninsula	2200 m	mud

Pannychia moseleyi

Sept 9 1964	63-213	50°54.5'N 130°6.0'W off Triangle Island	2200 m	mud
-------------	--------	--	--------	-----

Identification of following specimens uncertain because of deterioration but probably P. moseleyi

Sept 9 1964	63-202 trans. 4 St. 2	49°53.2'N 129°22.7'W off Brooks Peninsula	1830 m	mud
Aug 8 1965	65-58	51°27.0'N 131°47.5'W off Cape St. James	2430 m	mud

Paracaudina chilensis

July 10 1960	-	54° 131° SW Tow Hill, Q.C.I.	11 m	-
May 8 1972	-	54° 131° SW North Beach, near Tow Hill	intertidal sand	

Parastichopus sp. 1

Sept 10 1964	63-206	50°40.2'N 128°48.2'W off Cape Scott	212 m	-
1967	67-66	50°39.8'N 128°47.2'W off Cape Scott	200 m	rock gravel
Sept 1968	68-47	48°47.0'N 126°31.0'W off Tofino	285 m	rock gravel
Sept 1968	68-48	48°53.5'N 126°21.0'W off Tofino	156 m	mud
Aug 1969	69-36	51°54.7'N 128°51.1'W Q.C. Sound	106 m	sandy mud
June 1970	70-35	50°59.2'N 129°19.5'W off Triangle Island	179 m	mud
April 1971	71-11	49°45.3'N 127°2.4'W off Nootka	54 m	sandy mud

Parastichopus sp. 2

Sept 7 1965	JWS-164 FRB-GF- 65-3-37	54°50'N 134°00'W off Forrester I., Alaska	183 m	hard
Sept 11 1965	JWS-173 FRB-GF- 65-3-48	48°54'N 126°22.5'W off Tofino	156 m	gravel
Sept 11 1965	JWS-174 FRB-GF- 65-3-49	48°55'N 126°23'W off Tofino	159 m	gravel

June 1970	70-35	50°59.2'N 129°19.5'W off Triangle I.	179 m	mud
June 1970	70-50	50°8.9'N 128°4.3'W off Brooks Peninsula	159 m	-

Parastichopus californicus

Sept 26 1960	H-310	54°10.5'N 130°57.5'W Butterworth Rocks, near Pr. Rupert	82-91 m	-
Apr 12 1961	S-4 H-33	49°13'N 125°57'W S.W. Saranac I., Tofino	20 m	soft sand
June 26, 1961	-	48° 125° NE Effingham I.	-	-
Feb 23 1963	63-22	51°27.0'N 128°32.0'W Goose Bank	119 m	sand
Sept 15 1963	63-131	56°1.0'N 154°28.0'W Kodiak I.	249 m	-
May 16 1964	63-148	53°41.5'N 132°25'W Masset Inlet	91 m	-
June 17 1969	-	50° 124° SW Carrington Lagoon, Cortez I.	-	-
July 1970	70-74	49°14.1'N 125°56.6'W Tofino	27 m	shell

Pentamera sp. 1

June 23 1961	#8	48°49'N 125°34.3'W Barkley Sound	73 m	gravel mud
Jan 12 1963	63-2	50°36.9'N 126°57.7'W Malcolm I.	26 m	sand
June 1970	70-24	51°5.0'N 127°39.0'W off Kyuquot Sound	82 m	sand gravel

Pentamera sp. 2

July 17 1934	2231-33	49°22.3'N 126°55'W off Barkley Sound	137 m	-
June 22 1961	St. 1	49° 123° SW Porlier Pass	-	rocky
June 7 1962	Haul No. 1	53° 130° NW Kitkatla Inlet S. Porcher I.	37 m	-
June 27 1962	Drag 8	50° 124° SW Baker Pass, S. Cortez I.	117 m	gravel
Sept 6 1963	63-94	57°4.5'N 151°26.0'W Gulf of Alaska	256 m	-
Sept 8 1964	63-191 trans 3 St. 1	49°32.0'N 127°3.0'W off Tofino	115 m	sand mud
Sept 10 1964	63-204	50°19.6'N 128°06.5'W off Quatsino Sound	119 m	sand
1967	67-66	50°39.8'N 128°47.2'W off Cape Scott	200 m	rock gravel
June 1970	70-24	51°5.0'N 127°39.0'W off Kyuquot	82 m	sand gravel
Apr 1971	71-14	50°53.1'N 127°36.5'W near Nigei I., Q.C. Strait	421 m	mud

Pentamera sp. 3

July 14 1946	-	51°5.0'N 127°39.0'W Klucksiiwi, mouth Seymour Inlet	82 m	sand gravel
Jan 12 1963	63-1	50°36.4'N 126°50.9'W Malcolm I.	113 m	gravel rock
Sept 8 1964	63-191	49°32.0'N 127°3.0'W off Nootka Sound	115 m	sandy mud

March 12 1965	-	48°38.3'N 123°32.3'W Mill Bay	10 m	-
1967	67-66	50°39.8'N 128°47.2'W off Cape Scott	200 m	rock gravel

Pentamera lissoplaca

Apr 29 1961	S-4 H-99	54°13.6'N 132°57.2'W Langara I. Q.C.I.	64-70 m	rocky
Aug 9 1962	-	49° 123° SW Departure Bay	18 m	-

Pentamera populifera

June 25 1961	22	49°1'N 125°21'W Toquart Bay, Barkley Sound	-	-
Jan 12 1962	-	50° 126° NW Malcolm I.	-	-
June 27 1962	Drag 5 & 6	50° 124° SW Baker Pass, S. of Cortez I.	91 m	rocky
Sept 13 1962	Haul 9	48°58'N 123°37'W Kuper I.	22 m	soft
Jan 12 1963	63-2	50°36.9'N 126°57.7'W Malcolm I.	26 m	sand
Sept 1963	63-110	57°4.5'N 151°26.0'W Gulf of Alaska	256 m	-
Sept 8 1963	63-111	56°57.0'N 151°31.0'W Kodiak I.	238	-
Sept 9 1963	63-112	56°57.5'N 151°37.0'W Kodiak I.	242 m	-
Sept 9 1963	63-113	56°46'N 151°43'W Kodiak I.	220 m	sand gravel
Sept 8 1964	63-191 Trans. 3 St. 1	49°32.0'N 127°3.0'W off Nootka Sound	115 m	sandy mud

Pentamera pseudocalcigera

July 17 1934	2231-33	49°22.3'N 126°55.0'W off Nootka Sound	137 m	-
June 16 1954	-	49° 125° SW Bedwell Sd., Clayoquot Sound	-	-
Jan 31 1960	-	54° 130° SE Prince Rupert Hbr.	59 m	-
Feb 2 1960	-	53° 130° NW Kitkatla Inlet, S. Porcher I.	33 m	mud
Feb 2 1960	St. D	53° 130° NW Kitkatla Inlet	44 m	mud
Feb 6 1960		53° 130° NW Kitkatla Inlet	44 m	-
Feb 1961	-	53° 130° NW Kitkatla Inlet	-	-
Apr 12 1961	S-4 H-36	49°18.5'N 125°48.5'W Bedwell Sound	55 m	mud
Apr 30 1961	S-4 H-103	53°58.5'N 132°35.6'W Naden Hbr., Q.C.I.	18 m	mud
May 13 1961	S-4 H-140	48°43'N 123°26.5'W Satellite Ch.	51 m	mud
May 13 1961	S-4 H-141	48°44.5'N 123°24.8'W Fulford Hbr., Gulf Islands	33 m	mud
May 18 1961	St. 24	48° 123° NW Stuart Chan., Gulf Islands	190 m	-
Nov 10 1961	Haul 3	49° 124° NW Baynes Sound, S. Denman I.	55 m	-
Sept 13 1962	Haul 9	48°58'N 123°37'W Kuper I.	22 m	mud
Apr 16 1964	63-150	53°41.0'N 132°32.0'W Masset Inlet	86 m	mud

Sept 6 1964	63-168 Trans. 1 St. 2	48°22.8'N 125°14.1'W mouth Juan de Fuca Strait	183 m	mud
Sept 7 1964	63-169	48°22.8'N 125°14.1'W mouth Juan de Fuca Strait	183 m	mud
Sept 8 1964	63-187 Trans. 2 St. 2	48°52.5'N 126°18.0'W off Tofino	146 m	mud
Sept 8 1964	63-191 Trans. 3 St. 1	49°32.0'N 127°3.0'W off Nootka Sound	115 m	sandy mud
Sept 10 1964	63-205 Trans. 5 St. 1	50°40.0'N 128°48.5'W off Cape Scott	197 m	-
Apr 1971	71-1	48°54.8'N 125°12.5'W Barkley Sound	97 m	mud
Sept 1971	71-31	48°53.9'N 126°15.9'W off Tofino	128 m	sandy
Feb 1972	72-S-39	54°9.1'N 130°21.1'W Chatham Sound	60 m	-
Feb 1972	72-S-43	54°13.1'N 130°26.7'W Chatham Sound	72 m	-

P. trachyplaca

Aug 15 1962	62-26	52°8.0'N 131°9.9'W Cape St. James	27 m	boulders
-------------	-------	--------------------------------------	------	----------

Pseudostichopus mollis

Aug 26 1963	63-52 J.F.	58°7.0'N 148°50.0'W Gulf of Alaska	179 m	clay- gravel
Sept 14 1963	63-127 DBQ	55°53.0'N 153°45.0'W off Kodiak I.	228 m	mud sand
Sept 8 1964	63-185	48°44.4'N 126°30.0'W off Tofino	461 m	mud

Sept 9 1964	63-200 Trans. 4 St. 3	49°43.5'N 128°28.5'W off Brooks Peninsula	2200 m	mud
Sept 11 1964	63-213 Trans. 6 St. 4	50°54.5'N 130°6.0'W off Triangle I.	2200 m	mud
Aug 4 1965	65-43	51°49.0'N 131°17.0'W Cape St. James	1941 m	mud- sand
Aug 1965	65-46	51°43.0'N 131°13.5'W Cape St. James	1830 m	mud
Aug 10 1965	65-66	53°1.0'N 132°55.0'W off Skidegate	1190 m	mud
Aug 1965	65-71	53°33.0'N 133°38.0'W off Englefield Bay	1921 m	mud
Aug 25 1965	JWS-141 FRB-GF- 65-3-IV	51°20'N 129°05'W Q.C. Sound, W. of Calvert I.	247 m	mud gravel
Aug 25 1965	JWS-160 FRB-GF- 65-3-VIII	51°23'N 129°24'W Q.C. Sound W. of Calvert I.	146 m	gravel mud
Aug 28 1965	JWS-133 FRB-GF- 65-3-9	57°52'N 136°53'W NW Chichagof I., Alaska	293 m	sand gravel
Aug 28 1965	JWS-135 FRB-GF- 65-3-11	57°49.5'N 136°50'W N.W. Chichagof I., Alaska	183 m	sand gravel
1967	67-21	54°35.2'N 133°57.0'W S.W. of Forrester I.	237 m	boulders
1967	67-36	53°46.3'N 133°27.0'W W. of Graham I., Q.C.I.	805 m	boulders
Sept 1968	68-35	48°23.2'N 126°5.5'W off Barkley Sound	360 m	clay mud
Sept 1968	68-45	48°44.5'N 126°30.3'W off Tofino	436 m (318 m on chart)	rock

Sept 1971	71-47	54°28.6'N 133°53.3'W Dixon Entrance	256 m	mud
Sept 1971	71-43	53°00.8'N 132°55.8'W off Skidegate	1076 m	mud
Sept 1971	71-50	54°38.4'N 133°58.8'W entrance to Dixon Entrance	234 m	mud sand
Sept 1971	71-51	54°48.2'N 133°58.5'W Forrester I.	197 m	mud
Feb 1972	72-S-5	48°25.2'N 126°7.7'W off Barkley Sound	304 m	-

Psolidium bullatum

Apr 7 1961	S-4 H-6	48°24'N 123°27.5'W Constance Bank	37 m	gravel rocks
Apr 9 1961	S-4 H-11	48°58'N 125°21'W Barkley Sound	38 m	mud
Jan 12 1963	63-3	50°37.7'N 127°3.8'W Malcolm I.	60 m	shell gravel
June 1970	70-24	51°5.0'N 127°39.0'W Queen Charlotte St.	82 m	sand gravel

Psolus sp.

Sept 9 1964	63-197	49°19.0'N 127°25.6'W off Nootka Sound	1460 m	mud
Sept 11 1964	63-207	50°32.0'N 129°1.5'W S.W. of Triangle I.	1830 m	mud
Sept 11 1964	63-211 Trans. 6 St. 4	50°56.3'N 130°12.0'W off Triangle I.	2020 m	mud

Psolus chitonoides

June 21 1960	I-3	49°0.4'N 123°36.2'W off Reid I., Gulf Is.	64 m	-
--------------	-----	--	------	---

Apr 7 1961	S-4 H-6	49°24'N 123°27.5'W Howe Sound	37 m	gravel rocks
June 25 1961	#13	48°53.7'N 125°18'W Barkley Sound	137 m	mud-rock reef
June 29 1961	#33	48° 125° NE between Useless Inlet & Fatty Basin	-	-
Aug 15 1962	62-26	52°8.0'N 131°9.9'W Cape St. James	27 m	boulders
Jan 1 1963	63-3	50°37.7'N 127°3.8'W Q.C. Strait	60 m	-
Jan 15 1963	63-12	50°44'N 127°1.6'W Numas Is., Q.C. Strait	55-62 m	rocky
June 23 1970	-	50° 126° NW Restless Bay, Stuart Narrows	inter- tidal	-
May 17 1972	-	51° 127° SW Treadwell Bay, Queen Charlotte St.	-	-

Psolus squamatus

July 15 1954	-	50° 127° SW Quatsino Sd.	110-189 m	-
July 16 1964	63-163	50°20.0'N 124°44.0'W Pendrell Sound	82 m	mud-gravel
Sept 6 1964	63-175 Trans. 1 St. 5	47°58.0'N 125°47.2'W off Cape Flattery	924 m	rock boulders
Sept 8 1964	63-185 Line 2 St. 3	48°44.4'N 126°30.0'W off Tofino	461 m	mud
Sept 11 1964	63-214 Trans. 6 St. 3	51°9.0'N 130°9.0'W Q.C. Sound	869 m	-
Sept 12 1964	63-218	50°42.2'N 127°8.4'W Q.C. Strait	137 m	mud

1967	67-113	50°15'N 124°40.1'W Pendrell Sd.	37 m	sand-rock
Sept 1968	68-27	47°48.5'N 126°17.0'W Juan de Fuca Canyon	1784 m	clay
Apr 1971	71-39	52°5.5'N 131°26.7'W Cape St. James	1061 m	boulders

Scotoplanes globosa

Sept 11 1964	63-213 trans. 6 St. 4	50°54.5'N 130°6.0'W off Triangle I.	2200 m	mud
--------------	-----------------------------	--	--------	-----

Stichopus challengerii

Sept 15 1963	63-134	56°42.5'N 153°19.0'W S.E. Kodiak I.	128 m	mud-sand
Aug 28 1965	JWS 134 FRB-GF- 65-3-10	57°52'N 136°50'W NW Chichagof I., Alaska	366 m	sandy gravel
Aug 28 1965	JWS 135 FRB-GF- 65-3-11	57°49.5'N 136°50'W NW Chichagof I.	183 m	sand gravel
Aug 25 1965	JWS 141 FRB-GF- 65-3-4	51°20'N 129°5'W W. Calvert I., Q.C. Sound	247 m	mud-gravel
Sept 3 1965	JWS 149 FRB-GF- 65-3-23	56°18'N 135°29'W S.W. Baranof I.	192 m	mud-gravel
1967	67-21	54°35.2'N 133°57.0'W SW. of Forrester I.	237 m	boulders
1967	67-66	50°39.8'N 128°47.2'W off Cape Scott	200 m	rock gravel
Sept 1971	71-47	54°28.6'N 133°53.3'W Dixon Entrance	256 m	mud
Sept 1971	71-50	54°38.4'N 133°58.8'W Dixon Entrance	234 m	mud sand

Thyone benti

July 4 1960	-	54° 132° SE Cape Edensaw, Q.C.I.	37 m	rocky
-------------	---	-------------------------------------	------	-------

Thyonidium pellucidum

Aug 26 1963	63-52	58° 7.0'N 148° 50.0'W Gulf of Alaska	179 m	clay gravel
Sept 9 1963	63-113	56° 46.0'N 151° 43.0'W S.E. Kodiak I.	220 m	sand gravel
Sept 10 1963	63-119	56° 30.0'N 152° 35.0'W S.W. Kodiak I.	201 m	-
Sept 1971	71-51	54° 48.2'N 133° 58.5'W off Forrester I., Alaska	197 m	mud

Undescribed species

May 8 1961	-	52° 131° SE Burnaby Narrows, Q.C.I.	inter- tidal	-
June 23 1961	#8	48° 49'N 125° 34.3'W Barkley Sound	73 m	gravel mud
Aug 15 1962	Haul 6 & 7	52° 6.7'N 131° 8.2'W Houston Stewart Channel	30 m	gravel

Ypsilothuria bitentaculata

Sept 9 1964	63-202	49° 53.2'N 129° 22.7'W off Kyuquot Sound	1830 m	mud
-------------	--------	---	--------	-----

LITERATURE CITED

- Agatep, C. P. 1967. Elasipod holothurians of Antarctica I. genus Amperima
Pawson 1965. Bull. Sth. Calif. Acad. Sci. 66:54-68.
- Alton, Miles S. 1972. Bathymetric distribution of the Echinoderms off the
Northern Oregon Coast, p. 475-537. In A. T. Pruter and D. L.
Alverson, (eds.). The Columbia River Estuary and Adjacent Ocean
Waters. U. of Wash. Press, Seattle.
- de Blainville. 1834. Manuel d'Actinologie et de Zoophytologie, p. 188-197.
Paris.
- Brandt, J. F. 1835. Echinodermata ordo Holothurina. In his Prodomus
descriptions animalium ab. H. Mertensio in orbis terrarum
circumnavigatione observatorum. Fasc. 1:42-62.
- Carney, R. S. and A. G. Carey Jr. 1976. Distribution pattern of
holothurians on the N.E. Pacific (Oregon, U.S.A.) continental shelf
slope, and abyssal plain. Thalassia Jugoslavica 12(1):67-74.
- Clark, Hubert L. 1901. No. 15 Echinoderms from Puget Sound: Observations
made on the Echinoderms collected by the parties from Columbia
University, in Puget Sound in 1896 and 1897. Proc. Boston Soc.
29:323-337.
- _____. 1907. The apodous holothurians - A monograph of the Synaptidae and
Molpadidae. Smithson. Contrib. Knowl. 35:1-231, pls. 1-13.
- _____. 1922. The holothurians of the genus Stichopus. Bull. Mus. Comp.
Zool. (Harvard) LXV (3):39-74, pls. 1-2.
- _____. 1924. Some holothurians from B.C. Can. Field-Nat. 38:54-57.
- Deichmann, E. 1937. 10: The Templeton Crocker Expedition. LX. Holothurians
from the Gulf of California, the west coast of lower California and
Clarion Island. Zoologica (N.Y.) 22:161-176.
- _____. 1938. New holothurians from the western coast of North America and
some remarks on the genus Caudina. Proc. New England Zool. Club
16:103-115.
- _____. 1941. The holothurioidea collected by the Velero III during the
years 1932-1938. Part I, Dendrochirota. Allan Hancock Pac. Exped.
8(3):61-195, pls. 10-30.

- Deichmann, E. 1958. The holothurioidea collected by the Velero III and IV during the years 1932 to 1954. Part II, Aspidochirota. Allan Hancock Pac. Expeditions 2(2):253-349, pls. 1-9.
- Edwards, Charles L. 1907. The holothurians of the North Pacific coast of North America collected by the Albatross in 1903. Proc. U.S. Nat. Mus. 33:49-68.
- Ekman, S. 1926. Systematisch-phylogenetische Studien uber Elasipoden und Aspidochiroten. Zool. Jahrb. (Anat.) 47:429-540.
- Fabricus, O. 1780. Fauna Groenlandica.
- Forbes, E. A. 1852. Notes on animals of the class Echinodermata, collected by Dr. Sutherland. Journal of a voyage in Baffin's Bay and Barrow Straits in the years 1850-1851, performed by the ships "Lady Franklin" and "Sophia" under the command of M. W. Penny. by D. Sutherland vol. 2 Appendix p. 214.
- Grube, A. E. 1840. Actinien, Echinodermen und Wurmer des Adriatischen und Millelmeers, pp. 33-43. Konigsberg.
- Gunnerus, J. E. 1767. Beskrifning pa trenne Norska Sjo-krak, Sjopungar Kallade. Kongl. Vet. Akad. Handlingar:114-124, pl. 4, figs. 1-3. Stockholm.
- Haeckel, E. H. 1896. Systematische Phylogenie der Wirbellosen Thiere (Invertebrata) Zweiter Thiel des Entwurfs einer Systematischen Stammesgeschichte 8 vo., xviii + 720 pp. Reimer, Berlin.
- Hansen, B. 1975. Systematics and biology of the deep sea holothurians Part I. Elasipoda. Galathea Report 13:5-262, pls. 1-14.
- Heding, S. G. 1928. Papers from Dr. Th. Mortensen's Pacific Expedition 1914-1916. XLVI. Synaptidae. Dansk. Naturhistorisk Forening 1 Kobenhaven Videnskabelige Meddelelser 85:105-324.
- _____. 1931. On the classification of the Molpadids Preliminary notice. Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening Kobenhaven. 92:275-284.
- _____. 1942. Holothurioidea II. Aspidochirota Elasipoda, Dendrochirota. Danish Ingolf Exped. 4(13):1-39, figs. 1-43.
- Heding, S. G. and A. Panning. 1954. Phyllophoridae. Eine Bearbeitung der Polytentaculen Holothurien des Zoologischen Museums in Kopenhagen. Spolia Zool. Musei Hauniensis. 13:1-209, figs. 1-102.

- Koren, J. 1844. Beskrivelse over Thyone fusus og Cuvieria squamata. Nyt. Mag. f. Naturvid. 4:203-225, pls. i-iii.
- Ludwig, H. 1881. Revision der Mertens-Brandt'schen Holothurien. Zeit. Wis. Zool. 35:575-599.
- _____. 1894. Reports on an exploration off the west coasts of Mexico, Central and South America, and off the Galapagos Islands, in charge of Alexander Agassiz, by the U.S. Fish Commission Steamer Albatross during 1891. The Holothurioidea. Mem. Mus. Comp. Zool. Harvard 17:1-183, pls. 1-19.
- Mortensen, Th. 1932. The Godthaab expedition 1928. Echinoderms. Medd. om Gronland 79(2):1-62.
- Muller, J. 1850. Anatomische Studien uber die Echinodermen. Archiv. f. Anat. u. Physiol. 1850:129-155.
- Ohshima, Hiroshi. 1915. Report on the holothurians collected by the U.S. Fisheries steamer "Albatross" in the N.W. Pacific during the summer of 1906. Proc. U.S. Nat. Mus. 48:213-291, pls. 8-11.
- Ostergren, Hj. 1898. Das system der synaptiden. Ofvers. K. Sv. Vetensk. Acad. Forhandl.
- _____. 1907. Zur Phylogenie und Systematik der Seewalzen. Zoologiska Studier, tillagnade. Prof. T. Tullberg.
- Panning, A. 1949. Versuch einer Neuordnung der Familie Cucumariidae (Holothurioidea, Dendrochiota). Zool. Jahrbucher Abteilung fur Systematik, Okologie und Geographie der Tiere 78:404-470.
- Pawson, D. L. and H. Barraclough-Fell. 1965. A revised classification of the dendrochirote holothurians. Breviora (Mus. Comp. Zool.) Number 214:1-7. Cambridge, Mass.
- Perrier, R. 1902. Holothuries. Expéd. Scient. Travailleux Talisman: 273-554.
- Selenka, Emil. 1867. Beitrage zur Anatomie und Systematik der Holothurien. Zeitschrift fur Wissenschaftliche Zool. 17:291-374, pls. 17-20.
- Semper, C. 1868. Reisen im Archipel der Philippinen. Thiel II Wissenschaftliche Resultate. Holothurien 1:1-288, pls. 1-40. Leipzig.
- Stimpson, W. 1857. On the crustacea and echinodermata of the Pacific shores of North America. Boston Nat. Hist. 6:444-532, pls. 18-23.

Stimpson, W. 1864. Descriptions of new species of marine invertebrates from Puget Sound, collected by the naturalists of the North West Boundary Commission. Proc. Phila. Acad. 3:159.

Theel, H. 1879. Preliminary report on the Holothuridae of the exploring voyage of H.M.S. Challenger, 1. Bih. K. svenska Vetensk Akad. Handl. 5(19):1-20.

_____. 1882. Report on the Holothurioidea dredged by HMS Challenger during the years 1873-1876, Part I. Voyage of HMS Challenger Zoology Vol. IV.

_____. 1886. Report on the Holothurioidea dredged by HMS Challenger during the years 1873-1876, Part II. Vol. XIV.

